Analytical investigation of a figure-eight single-pulse all-fiber laser based on a nonlinear amplifying loop mirror

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Résumé en anglais	We establish analytically a master equation of a figure-eight all-fiber passively mode-locked laser. The nonlinear amplifying loop mirror (NALM) is used as an effective saturable absorber in order to generate short pulses. The master equation is of the cubic complex Ginzburg-Landau type, in which the coefficients explicitly depend on the characteristics of the cavity, in particular on the orientation of the polarizer, the coupling coefficient, and the length of the NALM. Single-pulse and continuous-wave (cw) solutions in both normal and anomalous dispersion are discussed analytically. In the anomalous dispersion situation, the equation governing the evolution of the system admits stable analytic pulse solutions. The pulse duration and energy are studied. The analysis provides domains in the space of the cavity parameters where energetic soliton and ultrashort pulses are obtained.
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